

measured synchronously, and their small changes subjected to covariant analyses (Scheffé, 1953) using a computer. The logical steps involved in defining causal relationships are described. The results are expressed not as reproducible, or reversible, relationships between variables, but as reproducible probabilities of finding such relationships.

The method has potential value in the study of drug effects on intact natural systems.

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The multiple emulsion formulation for the slow release of drugs.

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Multiple emulsions are water-in-oil emulsions which are redispersed in a second aqueous phase. Such emulsions have the advantage of being much less viscous than the primary water-in-oil emulsion and can be easily injected through a fine bore needle. The use of such emulsions as an alternative to the Freund type antigen-carrying adjuvant (water-in-oil emulsion) was suggested by Herbert (1965). Such a formulation for the slow release of drugs has been developed in our department since 1965.

The release of drugs from multiple emulsions is dependent on at least two types of mechanism, the break-up of larger particles and the osmotic gradient between the internal and the continuous aqueous phases. It can be influenced by altering three parameters, the osmotic gradient between the two aqueous phases, the internal phase volume and the concentration of the detergent necessary to form the primary water-in-oil emulsion. The release rate can be assessed by *in vitro* and *in vivo* methods.

The preparation of multiple emulsions will be demonstrated, as well as their naked eye and microscopic appearance. Examples of slow release of drugs from such emulsions will be shown using an *in vitro* technique as well as results of biological assay. The effect of manipulating the three parameters on release rate will be illustrated.

We thank the National Research Development Corporation for financial support.

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HERBERT, W. J. (1965). Multiple emulsions, a new form of mineral-oil antigen adjuvant. *Lancet*, 2, 771.

A method of investigating ureteral activity in the rat.

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Although the existence of a nerve supply to the ureter has been demonstrated (Wharton, 1932; Gruber, 1933; Lapides, 1948) the nature and function of this nerve supply is still in doubt. In an electron microscopic examination of the upper ureter of